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like the lightest coke, the vesicles, however, being considerably larger than those of the ordinary coke, and very uniform throughout. The septa between the vesicles are very thin, and the whole mass is so light that when a specimen is varnished over to prevent access of water to the cavities, it floats upon water like a cork. * * * Any attempt, however, to fix the age of these lavas must prove quite fruitless. All that we can say is, that it is very recent, even when time is judged by the historic or human standard. It cannot be many centuries old, and it may be more recent than the Spanish conquest. But there are reasons why lavas should here preserve for centuries the freshness which is lost in other countries in as many decades. The climate is arid, and there can be no question that the chemical action of the meteoric agents upon the lavas proceeds here with extreme slowness.

The volume ends with a discussion of the mode of excavation of the Grand cañon, of corrosion and weathering, and finally with a treatment of the details of its erosion.

Not only for its full and well written account of the geology of an extensive as well as not very accessible region, will the volume have its use, but especially as a contribution to dynamical geology, with regard chiefly to the action of running water and weathering, will this volume possess permanent value.

It is hardly necessary to add that the pencil of Mr. Holmes, whose genus for sketching geological panoramas is almost unique, has added materially to the value of the work. The wood-cuts and photo-engravings are drawn in his superior manner, while the chromo plates evince his facility in the use of water-colors.

Capt. Dutton's style and mode of handling his subject is clear and elaborate, and worthy of the subject. The atlas is in Bien's best manner.

GARMAN'S NORTH AMERICAN REPTILES AND BATRACHIANS.¹—The first-named of these brochures, as a simple catalogue is by itself of little weight as a contribution to science, but as connected with the illustrated paper which bears the second of the titles given below, and as a possible prodromus of others, it deserves attention. The system of the Bulletin No. 1 of the National Museum (which is devoted to this subject) has been so generally adopted by American herpetologists that it becomes necessary that some good reasons should be adduced for the many differences from it which the present system and list present. These reasons have not been given, so far as we are aware, and we think it can be shown that none can be found.

The author of these papers has clearly not been equipped for the task he has undertaken. In the systematic department he

¹ *A list of the species occurring north of the Isthmus of Tehuantepec, with references.* From the Bulletin of the Essex Institute, Salem, Jan., 1884. On the Reptiles and Batrachians [of the Kentucky Geological Survey]. From the memoirs of the Museum of Comparative Zoölogy, Cambridge, Mass. 4to (no date).

creates a number of new names, including two new generic names, which is an inexcusable proceeding, because the names are unnecessary. His selection of genera for adoption is purely arbitrary. Most of the rejected stand on as valid basis as those adopted, some of them on identical characters, as, for instance, *Eutænia* rejected and *Ophibolus* adopted, both resting on the entire anal scutum. The adoption of specific names is equally arbitrary. Of both kinds of types the author not infrequently displays remarkable ignorance. Thus the genus *Hypsiglena* Cope, is adopted, but a species of that genus, *H. torquatus*, is placed in *Sibon*, and two distinct species of the latter genus are placed under the "*S. torquatum*" as varieties or sub-species. So with *Sympholis lipiens* Cope, which appears in one place as a species of "*Gophis*," and in another under the synonym *Chilorhina villarsi* Jan., as a distinct generic form. *Contia episcopa* appears under the sub-generic head *Contia*, while its variety, *C. isosoma*, is placed under the sub-generic head of *Sonora*. The *C. pygæa* is not in the list at all. There are, in fact, several omissions of North American species, and so many Mexican species are omitted that the title of the paper is misleading. The arrangement of the species within the genera is confused, and does not in any way express their mutual relations. As an instance we refer to the collection of species he calls *Geotriton*. Four species of *Spelerpes* head the list, then an *Ædipus* (*O. variegatus*), then a *Spelerpes*, then an *Ædipina*, then four *Spelerpes*, then two *Ædipus*; then follows a *Stereochilus*, then a *Eryinophilus*, then a *Spelerpes*, and finally an *Ædipus* identical with the fifth on the list above named. No species of *Geotriton* appears. When we compare this suppression of genera with those adopted among the tortoises, at least nine of which are worthless, the inconsistency is striking.

The author of the catalogue has a singular plan of applying to a species the name of the author of the paper or work in which the description first appeared, although it may have been composed and written by another person whose name has been given as that of the true author. Thus Dr. Deyis has the pleasure of learning that the *Adelophis copei* was described by Cope and not by himself. All the species described by Cope in the *Zoölogy* of the Wheeler Survey are attributed to Yarrow, the zoölogist of the expedition; those published by Cope from Baird's manuscript are attributed to Cope, but with the complimentary insertion of a "Bd." in parentheses.

To correct this list would be to rewrite much of it. We only add that the *Diploglossus millepunctatus* O'Sh., is what Mr. O'Shaughnessy took it to be, and is not a *Eumeces*, as supposed by Mr. Garman; and that the list of species of *Ophibolus* is a miracle of confusion.

As with the genera, the adoption of species and subspecies is entirely arbitrary, and appears to depend on nothing but the fancy

of the author. An example of this may be seen in his species of *Crotalis*. Besides ignoring some good species, he adopts the *C. polystictus* under the later name, *C. ximmesii*, while he places the name *C. polystictus* as a synonym of the different *C. triseriatus* of Wagler. The quarto volume referred to contains a number of good plates, which gives some value to the work. On the whole, however, we think the author should have waited until his knowledge of the subject was more complete before attempting to publish.

GALTON'S RECORD OF FAMILY FACULTIES.¹—This book is a series of blanks designed for those who may desire to forecast the mental and bodily faculties of their children, and to further the science of heredity. As stated in the preface, the natural gifts of each individual being inherited from the ancestry, it is possible to foresee much of the latent capacities of a child in mind and body, of the probabilities of his future health and longevity, and of his tendencies to special forms of disease, by a knowledge of the traits of his ancestors. When the science of heredity shall have become more advanced, the accuracy of such predictions will improve, and meanwhile we may feel assured that fewer blunders will be made in rearing and educating children, under the guidance of a knowledge of their family antecedents, than without it.

It is to be hoped that those at all interested in the improvement of the race in general, as well as their own descendants, will make a fair trial by keeping such a record as this, and we hope that similar blanks may be issued in this country by our boards of health, a work which has already, we believe, been done in Massachusetts.

In reading the introduction, and looking over the blanks, we may obtain some idea of what of a practical nature is involved in the idea of heredity. It is the custom with many to make light of heredity, as if there were little in the matter; whereas, the intelligent observer is well aware that, together with variation, heredity is one of the twin forces in the world of life.

One is proud of his distinguished ancestors, but in such a record as this, equal attention is paid to the claims of every ancestor in the same degree of kinship. "No countenance is given to the vanity that prompts most family historians to trace their pedigree to some notable ancestor, and to pass the rest over in silence. It demands an equal recognition of all the lines. We should remember the insignificance of any single ancestor in a remote degree. In the fourth generation backwards there are sixteen ancestors, from whom the child receives on the average an equal inheritance. In the fifth there are thirty-two. One ancestor who lived at the time of the Norman conquest, twenty-four

¹ *Record of Family Faculties*, consisting of tabular forms and directions for entering data, with an explanatory preface. By FRANCIS GALTON, F.R.S. London, Macmillan & Co., 1884, 4to.